REMARKS

The pending claims are 11-20.

Applicant is pleased to see that no art rejection has been applied against claims 12-15 and 19. The Examiner's finding that claims 12-15 and 19 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. § 112, 2nd paragraph, and to include all of the limitations of the base claim and any intervening claims, is gratefully acknowledged. Applicant submits that, in view of the above amendments, these claims are now in condition for allowance.

Applicant further submits that the remaining claims are allowable for reasons set forth below.

Office Action

Turning now to the Office Action in greater detail, the paragraphing of the Examiner is adopted.

Paragraphs 2-3 (Claim Rejections - Formalities)

Claims 11, 12, 14, 16, 17 and 20 are rejected under 35 U.S.C. §112, 2nd paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The applicant appreciates the Examiner's careful review of the claims. The applicant has carefully reviewed and revised the claims taking care not to introduce any new subject matter.

Regarding what is being claimed in claims 11 and 17, first subparagraph, this concerns the use of the term network as applied to phase shifters, and claims 11 and 17 have been revised for clarity based upon Fig. 3 and paragraphs 11 and 21 of the specification. Claim 12 is also amended at line 3 to obviate a potential lack of antecedent basis.

Regarding what is being claimed in claim 12, the claim is amended based upon Figs. 2 and 3 to clarify which antennas comprise the second set, and to expand the term "the components".

Regarding what is being claimed in Claim 14, the Examiner is correct, and the claim is amended to correct this typographical error.

Regarding what is being claimed in Claims 16 and 20, with respect to the first issue, the kind suggestion of the Examiner is adopted. With respect to what is meant by "one of the two lobes", the language of the claim is amended herein based upon paragraph 24 of the specification to clarify the intended scope of these claims.

Regarding claim 20, lines 7-11, the claim is clarified by deletion of the term "or reception".

Entry of the amendments and withdrawal of the rejections is respectfully requested.

Paragraphs 4-6 (Claim Rejection - Anticipation)

Claims 11, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,266,010 (Ammar, et al., herein "Ammar"). According to the Examiner, Ammar teaches an antenna for transmitting and receiving and comprising antenna ports coupled to respective feed lines from a beam former wherein the beam former has switches and phase shifters for electronically switching among at least one sum beam and at least one difference beam.

Claims 11, 17 and 18 are further rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4,359,742 to Smith. According to the Examiner, Smith discloses a dual switch multimode array antenna wherein multiple beam patterns are electronically switched to provide various sum and difference patterns.

Applicants respectfully traverse both rejections.

To anticipate a claim, a reference must teach every limitation of a rejected claim. Applicant asserts that the cited references do not teach the present invention.

The present invention addresses the problem of increasing demand for sector-wide coverage of large angle areas. Current systems make use of separate individual antennas serving respective sectors. Antenna characteristic is not switchable.

The present invention overcomes this problem using antenna arrays to sector-wise cover a large angle area with high frequency elements and antenna elements. Individual antennas

are connected via phase-shifters or hybrid junctions wherein each individual antenna array includes a sum input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a sum diagram and the antenna array also includes a differential input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a differential diagram. The antenna elements are driven and can be selected to be either in-phase or in phase-opposition relative to each other.

The antenna mean radiation pattern or directional characteristic exhibits further differential diagrams by the resulting change of the phase behavior due the selection of the individual antennas, or in that at least one of the phase shifter or hybrid junctions of the network is switched, such that the antenna mean radiation pattern or directional characteristic exhibits further differential diagrams due to the resulting change of the phase behavior upon the selection of the individual antennas. Antenna elements are driven such that the individual elements are individually operable and can be selected to be either in-phase or in phase-opposition relative to each other.

Present claim 11 is thus directed to an antenna array comprising individual antennas connected via phase-shifters or hybrid junctions for increasing the directional resolution and angular coverage.

Ammar teaches an antenna system that can be configured to produce a differential output by selecting switches S1-S8 of a beam-forming network. However, as stressed at many points in Ammar, the antenna system has only a single (summing) output (210, Fig. 2, and col. 2, line 18). In contrast, Claim 11 of the instant application recites "wherein the antenna array includes a differential input for selecting the individual antennas ..." (emphasis added). Thus, the present invention provides a single differential input that is used to select among a plurality of individual antennas. Ammar does not teach this element. Instead, Ammar teaches only a single summing input, together with a plurality of inputs, each of which is used to operate one of switches S1-S9 to each select an individual antenna. Therefore, Ammar does not teach all of the elements, as required.

Further, Applicant notes that both disclosed embodiments of Figs. 2 and 3 have, at their respective inputs, a hybrid junction (4). Ammar does not teach a hybrid junction.

Smith teaches a dual switch array antenna comprising, in its preferred embodiment, two waveguide switches and two waveguide phase shifters (see, e.g., col. 2, lines 26-49). Sum (82) and difference (72) ports are provided.

However, Smith does not teach a hybrid array.

The above-mentioned features are neither present in, nor obvious over, the cited references, taken alone or in combination.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 102 is respectfully requested.

Paragraphs 8-9 (Claim Rejection - 35 USC §103)

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being obvious over any one of Ammar or Smith in view of either Masak et al. or Pierrot (both previously of record).

Claims 16 and 20 represent a preferred embodiment of the invention, wherein by addition of one further antenna it becomes possible to determine the direction of reception of a signal.

Applicant notes that neither Masak nor Pierrot teaches a hybrid junction and therefore do not remedy the deficiency of Ammar and Smith. Therefore, the claims as amended herein cannot be rendered obvious by any combination of the cited art because not all of the elements are taught, as required.

In addition, Applicant asserts that the required reasonable expectation of success in combining the references has not been provided, and therefore a *prima facie* case of obviousness has not been established, because the secondary references teach cancellation of undesired side-lobes rather than the use of side-lobe suppression to establish reception direction.

Accordingly, withdrawal of the rejection is respectfully requested.

As there are no remaining rejections or objections, Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If the Examiner considers

that there are any remaining issues that may be addressed by telephone, the Examiner is requested to contact the undersigned at the number below.

Respectfully submitted,

Christopher J. Kay
Registration No. 44,820

PENDORF & CUTLIFF
5111 Memorial Highway
Tampa, Florida 33634-7356
(813) 886-6085

Date: **March 17, 2004**

CERTIFICATE OF MAILING AND AUTHORIZATION TO CHARGE

I hereby certify that the foregoing AMENDMENT B for U.S. Application No. 09/979,564 filed November 14, 2001, were deposited in first class U.S. mail, postage prepaid, **Mail Stop:** Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **March 17, 2004.**

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application, except for the issue fee, without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.

Christopher J. Kay